Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A method for preparing a lactase microcarrier for hydrolyzing lactose in a liquid, the method comprising:

transforming a food-grade lactic acid bacterium with a DNA construct, wherein the DNA construct comprises a lantibiotic promoter sequence operatively linked to a DNA sequence encoding a β-galactosidase;

culturing the bacterium under conditions that enable expression of the β-galactosidase in an amount sufficient exhibit ~~exhibits~~ a β-galactosidase activity of at least 4000 Miller Units; and

permeabilizing the bacterium,

wherein a preparation of permeabilized bacteria equal to about 1.55 at OD_{600} can hydrolyze either (i) about 100% of lactose in skim milk at a temperature of about 55°C within two to three hours, (ii) about 50% of lactose in skim milk at a temperature of 4°C within two to three hours, or (iii) both (i) and (ii).

2. (cancelled)

3. (previously presented) The method of claim 1, wherein the lactic acid bacterium is selected from the group consisting of *Streptococcus, Aerococcus, Carnobacterium, Enteroccus, Erysipelothrix, Gemella, Globicatella, Lactobacillus, Lactococcus, Bifodobacteria, Leuconostoc, Pediococcus, Tetragenococcus,* and *Bagococcus bacteria.*

4. (original) The method of claim 1, wherein the lactic acid bacterium is a *Lactococcus lactis.*

5. (original) The method of claim 1, wherein the DNA sequence encoding β-galactosidase is from a *Streptococcus thermophilus*, *Lactobacillus bulgaricus, Bifobacterium species, Aspergillus niger, Aspergillus oryzae, Kluyveromyces fragilis, Kluyveromyces lactis, Bacillus subtillus* or *Arthrobacter species*.

6-7. (cancelled)

8. (original) The method of claim 1, wherein the promoter is a nisin gene promoter.

9. (original) The method of claim 1, wherein the promoter is a nisA promoter.

10. (previously presented) The method of claim 1, wherein the bacterium is permeabilized by an agent selected from the group consisting of a chemical, a solvent, and a detergent.

11. (original) The method of claim 1, wherein the bacterium is permeabilized by ethanol, isopropanol, or a combination of ethanol and isopropanol.

12. (previously presented) The method of claim 10, wherein the detergent is selected from the group consisting of deoxycholate, sodium dodecyl sulfate, rhamnolipid, and chenodeoxycholate.

13. (original) The method of claim 1, wherein the bacterium exhibits a β-galactosidase activity of at least 10,000 Miller Units.

14-24. (cancelled)

25. (currently amended) A permeabilized lactic acid bacterium containing a heterologous β-galactosidase, wherein the bacterium exhibits a β-galactosidase activity of at least about 4000 Miller Units, and wherein a preparation of permeabilized bacteria equal to about 1.55

at OD_{600} can hydrolyze either (i) about 100% of lactose in skim milk at a temperature of about 55°C within two to three hours, (ii) about 50% of lactose in skim milk at a temperature of 4°C within two to three hours, or (iii) both (i) and (ii).

26. (previously presented) The permeabilized bacterium of claim 25, wherein the bacterium is selected from the group consisting of *Streptococcus, Aerococcus, Carnobacterium, Enteroccus, Erysipelothrix, Gemella, Globicatella, Lactobacillus, Lactococcus, Bifidobacteria, Leuconostoc, Pediococcus, Tetragenococcus*, and *Bagococcus* bacteria.

27. (original) The permeabilized bacterium of claim 25, wherein the bacterium is a *Lactococcus lactis.*

28. (original) The permeabilized bacterium of claim 25, wherein the β-galactosidase is a *Streptococcus thermophilus* β-galactosidase.

29. (original) The permeabilized bacterium of claim 25, wherein the bacterium is in a lyophilized form, in a concentrated cell suspension, or immobilized.

30. (original) A composition comprising the permeabilized bacterium of claim 25.

31-36. (cancelled)